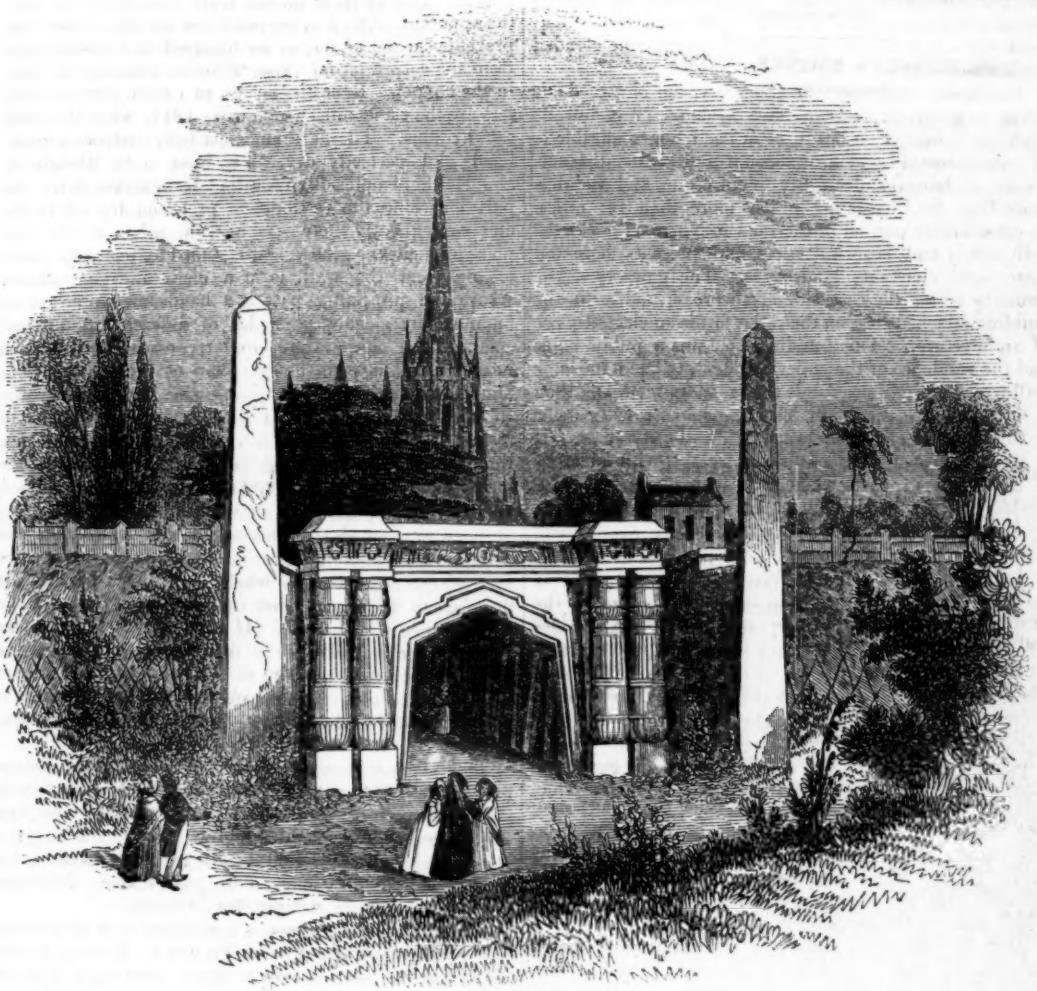
THE PENNY MAGAZINE

OF THE

Society for the Diffusion of Useful Knowledge.

495.] PUBLISHED EVERY SATURDAY. [DECEMBER 21, 1839.

CEMETERIES.



[Entrance to the Catacombs of the Cemetery at Highgate.]

THE North London or Highgate Cemetery, consecrated in May last by the Bishop of London, is situated at a distance of little more than four miles from the Exchange. Its grounds comprise about twenty acres, forming a portion of that side of Highgate Hill which faces the metropolis. We enter them from a lane on the west by a little Gothic building. On the left of this stands the chapel. It contains a gallery for the use of friends and others who may wish to be present. On the right of the gateway are several retiring-rooms and the residences of the various officers of the establishment. The grounds generally are laid out with good taste, though in rather a florid style, and the natural beauties of the situation developed and enhanced by the aid of art. From the entrance broad gravel paths wind to the right and to the left, whilst a carriage-road conducts visitors up the steep face of the hill towards the new and handsome church of Highgate, dedicated to St. Michael, which crowns the summit, appearing from different parts of the grounds to great advantage, and which even seems, at a hasty glance, to appertain to the cemetery. Throughout the grounds, parterres of sweet-scented flowers, picturesque trees, and clumps of evergreens are scattered in the most appropriate spots. As we ascend the hill we see on the left an archway of Egyptian character, which forms the entrance to the catacombs, in which the coffins are placed in cavities formed by the most solid masonry. Having examined these, a circular path brings us again to the entrance. On the top of the central compartment of the catacombs is a fine cypress-tree, spreading its dark branches over the whole. Leaving the catacombs, we find ourselves almost immediately on a broad level terrace, with a handsome balustrade, at the very foot of the church. The view from this point is remarkably fine, and is alone well worth a visit from the metropolis. The beauties of the place, indeed, appear to be fully ap-

preciated, for the gardens, as we may not inappropriately call the grounds, are daily filled with persons, evidently enjoying the quiet, the pure air, and the splendid landscape. Standing upon this terrace, the spectator sees immediately below him the cemetery-grounds, with their close-cut lawns and flower-borders, and the light pinnacles of the chapel contrasting with the dark foliage behind; beyond this his eye ranges along the undulations of the valley, whose sides are covered with gently-sloping green fields, relieved at intervals by ancient elms and wide-spreading lime-trees; whilst farther still appears *London*, with its mighty mass of buildings and its thousand spires and towers rising dimly through the clouded atmosphere.

The South Metropolitan Cemetery, at Norwood, is much larger than that we have been noticing, but its situation is neither so beautiful in itself, nor so eligible to the inhabitants of London, on account of its greater distance. Its site is, however, decidedly picturesque, and the distance from the City is not much more than six miles. A considerable portion of the road to Norwood is skirted with stately and beautiful villas, and presents here and there some charming landscapes. The gateway of the cemetery is on the east side of the road, and, with the building attached to it on the right, forms an elegant piece of architecture. This building contains a public office and the residence of the superintendent. The handsome wall which entirely surrounds the cemetery is no less than a mile and a quarter in length, of brick, with stone mountings, and encloses a space of above forty acres. It is about twelve or fourteen feet in height, with openings of iron-work in parts where it has been considered desirable to open the view into or from the gardens. Along its inner side, surrounding the grounds, is a belt of young forest-trees, which, as they grow up, will almost entirely enclose the cemetery within their leafy screen. Passing through the gateway, we are in the grounds, which slope gently from the right down towards the wall on the left, and straight before us rise boldly to a considerable height, on the top of which stand the two chapels, the Episcopal and the Dissenters'. Both are light and elegant specimens of Gothic architecture, and both have cloisters stretching out at right angles for each of their sides. The first directly faces us as we mount the steep, but the front of the second is directed to the north. Before entering either of the chapels, we cannot but pause and look around us. On each side the grounds descend from our feet to the wall, the fresh green turf relieved by the darker clumps of shrubs, flowers, and trees, planted at intervals over the cemetery, and by the scattered tombs which indicate the purposes of the place.

Directly behind the Episcopal chapel, that is, toward the east, the view is bounded by Dulwich Wood, belonging to the famous College of that name. On the north, immediately beyond the wall, is the park formerly belonging to Lord Chancellor Thurlow; beyond that is Herne Hill, and still farther we catch a glimpse of one of the towers of Westminster Abbey, and enjoy an excellent view of St. Paul's. The front of the Episcopal chapel consists of a very lofty pointed arch between slender towers, surmounted by open and delicately sculptured lanterns, and with cloisters, as we have before mentioned, on each side. The extremities of the cloisters are ornamented with pinnacles. The arch forms a covered space, answering the purposes of a portico, in the upper portion of which, at the back, is a large and handsome Gothic window. The outer doors open into a small vestibule, with a little waiting-room on the left hand, and with stairs descending to the vaults on the right. Passing through the opposite doors, we enter the chapel, which is lofty, light, and of beautiful proportions. The fittings-up are all of the collegiate character. The imitations of carved oak on the wall, when finished, will tend greatly to give the interior of the chapel the appearance of a cathedral choir. The beautiful screen, at present so injudiciously placed in the Dissenters' chapel, would, if removed here, complete the effect. The roof of the vestibule forms the floor of a gallery for spectators. In the centre of the chapel stands a kind of high oblong table, covered with black drapery. Its purpose is to conceal the very ingenious machinery which, at a given secret signal, conveys the coffin placed on its top slowly down into the vaults below, without the slightest noise to indicate the nature of the agency, which is the hydraulic-pump. The top of the machinery, forming the cover of the apparent table, revolves with a slight push, and thus prevents the noise and bustle which would otherwise arise from the corpse-bearers having to turn the coffin round in the chapel. Beneath the sacred edifice and its cloisters are the catacombs, which will contain, we understand, 2000 coffins. They are sufficiently lighted, well ventilated, and perfectly dry. The front of the Dissenters' chapel differs materially from that of the Episcopal. The part enclosing the vestibule is projected from the wall, and consequently there is no interior gallery nor exterior place of shelter. Buttresses, attached to, but partly projecting from the wall, form a distinguishing feature. Above the projecting part is a handsome window, surmounted by elegant pinnacles of different shapes and sizes. The cloisters are similarly ornamented. The interior is plain, with the exception of the screen before alluded to, the handsome pulpit, and the cornice which enriches the edge of the ceiling. With respect to the machinery, the catacombs, &c. of the Dissenters' chapel, there is, we believe, no material difference from what we have already described in connection with the Episcopal chapel. In the cloisters of both, monumental tablets may be erected to the memory of the departed. The road from the gateway, which, ascending the hill, passes between the chapels, and then descends on the other side to the wall, marks the line of demarkation between the consecrated and unconsecrated ground, the latter being in extent about one-third of the whole. A chaplain of the Church of England and a dissenting minister (Independent) are engaged by the proprietors to officiate whenever their services are required. No less than 70,000*l.* have altogether been expended upon this great work; and although the liberality of its projectors does not appear to have yet met with its reward, we are glad to hear that in the present, as compared with the previous year, the burials have increased three-fold.

The other metropolitan cemeteries, projected or in progress, are: — Abney Park at Stoke Newington; the West of London and Westminster, in Earl's Court, Brompton; another at Mile-End; and another at Newington Butts. We wish them all success, not only because they afford secure repose to the ashes of the dead, and in some measure mitigate the sorrows of the living by associating their griefs with the pleasant and beautiful influences of nature, but also because they are indispensably necessary for the sake of the public health, which suffers continual detriment from the prevailing mode of burial in the common churchyard of the densely inhabited metropolis.

RICHARD CROMWELL AND HIS WIFE.

(Concluded from No. 494.)

For some time Richard went under a feigned name—"not, as is pretended, that he wanted an alias to defend him against any debts except those which were indeed the debts of the public; but because the curiosity of the people to gaze at a man who had been in the state of the greatest prince in Europe, and was now reduced to the state of a plain country-gentleman, would have been very troublesome to him, had he always gone by the name of

Richard Cromwell."* He sometimes called himself Mr. Wallis, but more generally Mr. Richard Clark. His limited fortune, the necessity or expediency of not drawing too much attention upon him so as to excite the jealousy of the government, his experience of the hollowness of society, all contributed to make him live in a very quit and retired manner. Yet he was far indeed from the unsocial or ascetic spirit; he occasionally paid visits and still more frequently received some old and tried friends at his own house at Cheshunt. Of course he was careful as to what new acquaintances he made. Spies and informers were constantly in the pay of government in those days, and a very little malice and ingenuity might have sufficed to turn the old gentleman's peculiarities into state crimes. Doctor Lort, an industrious collector of recondite matters, related, on the authority of the Rev. George North, vicar of Codicote, near Welwyn in Hertfordshire (who had been acquainted with two persons that had frequented Richard in the last years of his life at Cheshunt), the following particulars:—"None were admitted to visit him but such as had strong recommendations from some of his intimate acquaintance as being men of an agreeable and cheerful conversation and of strict honour. One of the two persons just mentioned, who lived at Ware, was recommended under this character, and introduced to him with an admonition to conform to the old gentleman's peculiarities, without asking any questions or seeming to make observations. After an hour or two had been spent in conversation and in drinking, Richard started up, took the candle, and was followed by the rest of the company (who all, excepting the last admitted man, knew what was going forward), carrying the bottle and the glasses into a dirty garret, where was nothing but a round hair trunk. This Mr. Cromwell pulled out to the middle of the room, and, calling for a bumper of wine, drank 'Prosperity to Old England!' The company did the same, when the new guest was called to do so, sitting aside on the trunk, as all of them had done. Richard desired him to sit light, as he had no less under him than the lives and fortunes of all the good people of England! The trunk was then opened, and the original addresses showed him, with great mirth and laughter. Such was Richard's method of initiating a new acquaintance."

To the uninitiated, to all except his nearest friends, he ever cautiously avoided speaking of his former greatness. The pious Doctor Isaac Watts, the author of the hymns, who lived at Stoke Newington, and who frequently visited at Cheshunt, used to say that he never heard Richard allude to his former station except once, and then in a very distant manner.

He continued to love ardently the sports which he had followed in his happy home at Hursley, before his greatness began, and he hunted, shot, hawked, and fished to the last year of his green old age. It is reported of him that he enjoyed an uninterrupted state of health, and that when he was eighty years old he would gallop his horse for several miles together without drawing rein or feeling fatigue. He was, no doubt, a far healthier and happier man than he could have been if he had retained his greatness.

When the Romish zeal and stupid despotism of James II. brought about the Revolution of 1688, Richard's son Oliver, who not only bore the name but had the look and some of the genius of his grandfather, was very active; and after the flight of James and the raising of the Jacobite banner in Ireland, he offered to supply a regiment of horse, provided he might have the naming of his own officers. But King William, who well knew how old Oliver had written his name there, and how popular Henry Cromwell had been in that country, declined the offer, acknowledging his reason for so doing, which was a dread of the name of "Oliver Cromwell." Doubtless he also recollected how Oliver, who had ended by being infinitely more the master of the three kingdoms than he (William) ever was, had begun by raising a regiment of horse for the parliament.

This only son Oliver died at Hursley, in the year 1705, in the reign of Queen Anne. His death led to a litigation which for a time must have embittered his father's life. As Oliver had never been married, Richard became entitled to a life estate in the manor of Hursley, which, as his wife Dorothy's jointure, had devolved to Oliver in right of his mother. After his son's decease Richard sent his youngest daughter to take possession of that estate, but the lady not only took possession, but also endeavoured to keep possession to the barring of her father's right. Her sisters, it is said, joined her in the foul attempt, alleging that he was superannuated, and ought to be satisfied with a small yearly allowance out of the estate. Richard had always been an affectionate parent, but he was not so much so as to submit to this unnatural violence, and he soon showed his daughters that old age had not made him helpless. He brought his action in the courts of Westminster. When he was obliged to appear personally, his sister, the lady Fauconberg, who was living in affluence and honour, sent her coach and equipage to conduct him; and when he appeared in Westminster Hall, the judge, mindful of his venerable old age and his former elevation, conducted him into an apartment where refreshments were prepared, and ordered that he should be accommodated with a chair in court, and sit covered.

The old man gained his cause, and had the painful satisfaction of hearing the conduct of his daughters severely censured. Queen Anne is said to have had the good feeling and good sense to applaud the judge for the proper attention he had shown to a man who had once been a sovereign.

As Richard was retiring from Westminster Hall, his curiosity, or probably a stranger and a stronger feeling, led him into the House of Lords. He was asked, when he had been there last. "Never," said the octogenarian, pointing with a smile to the throne, "since I sate in that chair!"

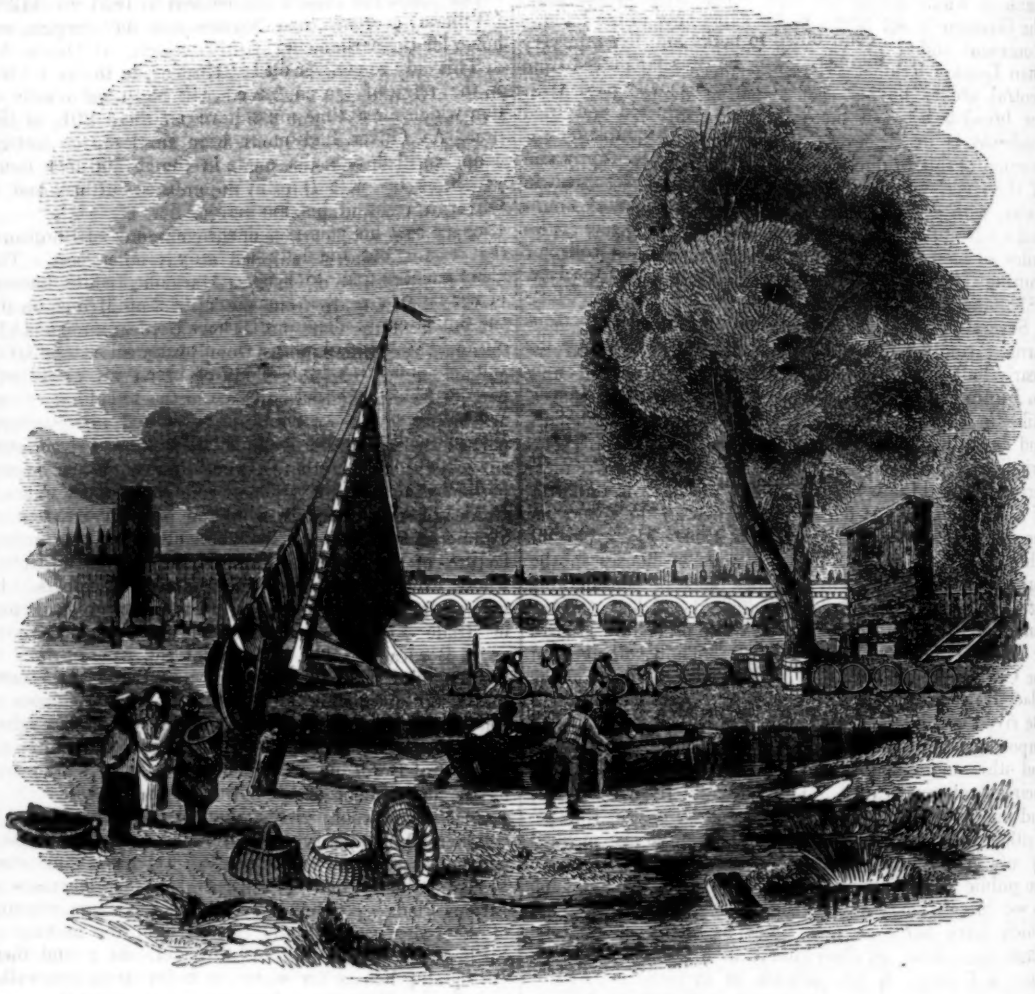
He lived several years after this, and died at Cheshunt, in 1712, in the last year of the reign of Queen Anne, and in the 86th year of his age. His remains were removed with some pomp from Hertfordshire to Hampshire, and deposited near to those of his wife Dorothy and his son Oliver, in the chancel of Hursley Church. It is consoling to reflect that the old man must have been reconciled to his unkind daughters, and attended by them on his death-bed. In his last illness, and just before his eternal departure, he said to them, "Live in love; I am going to God, and God is love."

The antiquary Doctor Gough, who was vicar of Enfield, and well acquainted with the history of the neighbourhood, says (in 1770), on writing to his brother antiquary, the accomplished Michael Tyson,* who, on his mother's side, was related to the Cromwells, says—"Richard Cromwell died in 1712, in the arms of the late parish clerk of Cheshunt, in a house of Baron Pengelly's. . . . The clerk was servant to the baron, and died *this summer*, bedridden."

* Oldmixon, 'Hist. of England,' during the reigns of the royal House of Stuart.

* Poor Tyson, who really was what antiquaries rarely were in the last century, a man of taste and wit, speaks with horror of a certain Mrs. Holgate who had just destroyed a cart-load of old deeds, seals, &c., not sparing an original letter of the protector Oliver Cromwell's with a lock of his hair enclosed. "The excuse," says he, "that she makes for this sacrilege is, that she is removed from the priory to a small house, and wants every foot of room in it." If there had not been so many Mrs. Holgates in the land and so much indifference about old documents and traditions, we might have had more anecdotes to offer about Richard Cromwell and other remarkable individuals.

BORDEAUX.



[Bordeaux, and Bridge over the Garonne.]

BORDEAUX, one of the largest and most beautiful cities of France, is known to comparatively few of the hosts of our countrymen who visit the Continent. The destination of the majority is Paris, and they have but just time to take a brief view of the most striking objects of attraction which it contains, the demands of business allowing but few of them to extend their tour four hundred miles south of the capital, to the ancient provinces of Guienne and Gascogne. Bordeaux, the principal city in this part of France, once the seat and stronghold of the English power on the Continent, was intimately connected with the most striking events of our history during the thirteenth and fourteenth centuries. The cathedral and the Hôtel de Ville were both built by subjects of the kings of England. It was from Bordeaux that Edward the Black Prince set out on that memorable expedition which terminated in the battle of Poitiers (A.D. 1336), and to it he conducted his royal prisoner John II., king of France. The duchies of Guienne and Gascogne were added to the extensive possessions of the English monarchs in France, in the twelfth century, by the marriage of Eleanor, the divorced wife of Louis VII. of France, to Henry, count of Anjou and king of England (Henry II.). In the great wars between France and England during the reigns of Edward III., Richard II., and the Fourth, Fifth, and Sixth Henries, Bordeaux became a place of great importance. Edward III. made it the capital of several provinces which he formed into a principality for his valiant son the Black Prince, who passed eleven years there in the splendours of sovereignty. His son Richard II. was born at Bordeaux. Richard ceded Guienne to John of Gaunt, duke of Lancaster, but the Bordelois were so much attached to the English crown that they refused to acknowledge their new sovereign. The connection of Bordeaux with England continued until the reign of Henry VI., when the city capitulated on favourable terms to Louis VIII. of France, in 1451. But the ties which had subsisted for upwards of a century were not broken off without another struggle, and after their submission to Louis, the Bordelois rose in favour of English rule. An army was sent to support them, commanded by the Earl of Shrewsbury, but it was beaten, and Bordeaux was forced to submit a second time to its new masters, who now imposed harder terms, and at the same time built the Château Trompette and the Château of Ha, to ensure the fidelity of the inhabitants, and to prevent the English coming to their assistance.

Many of the streets, squares, quays, public buildings, and private houses of Bordeaux are remarkably fine, and even magnificent, while they derive additional splendour

from the striking view which they present from the river, which is twice the width of the Thames at London, and forms here a considerable curve, on the outer or concave bank of which stands the city. The stone bridge over the Garonne is one of the finest works of the kind on the Continent, and is 531 yards in length, or one-third longer than London Bridge. It has seventeen arches, the seven central arches having each a span of eighty-seven feet; the breadth between the parapets is fifty feet, and the road-way is nearly level. The difficulties attending the erection of this bridge were very great, owing to the depth of the river, which in one part is twenty-six feet at low-water, with a rising tide of from twelve to eighteen feet, and a current which often flows with the velocity of seven miles an hour; and, to add to these obstacles, there is a shifting and sandy bottom. The bridge was begun in 1811, and finished in 1824.

Several of the finest streets are lined with trees, and form a fine promenade. Thus the Cours d'Albret is nearly half a mile long, and the Cours du Tourny and du Jardin Public form together a line three-quarters of a mile in length. The street Chapeau Rouge in length and breadth resembles Portland Place in London. The principal square is the Place Louis Philippe Premier, formerly Place Louis Seize, each side of which is a quarter of a mile long. At one end it is open to the river; on the other it is crossed by the Cours Douze Mars, beyond which the Place is enclosed by a range of houses in the form of a crescent. On the sides plots of considerable size are planted with trees, forming the Allées Angoulême and de Berri. There are several other fine squares or "places," and a public garden. The Exchange and the Custom-house, both fine edifices, form two sides of the Place Royale. The quays stretch to a great length along the river, and have an appearance at once interesting and imposing. The public bonding-warehouses for colonial and other merchandise and produce are remarkable for their extent and beauty. The principal theatre for size and magnificence is scarcely exceeded by any in Europe. Neither the cathedral nor the Hôtel de Ville are marked by any very striking features. Bordeaux possesses all the public establishments of a city of the first class, such as we in vain look for in the great towns of England which have three or four times as many inhabitants. There are a mint, an observatory, an Académie Universitaire, a College Royal, schools of architecture, hydrography and navigation, botany and natural history, drawing and painting, medicine and surgery; several learned societies, a public library, museum of antiquities, and a gallery of paintings.

Bordeaux is the chief outlet of the south-western and even of the southern and midland parts of France. Its situation on the Garonne, not far from the æstuary of the Gironde, which receives the waters both of the Garonne and the Dordogne, gives to Bordeaux the advantage of nearly one thousand miles of river navigation. The Canal du Midi, 154 miles long, connects the Garonne with the Mediterranean. This canal, however, enables the merchants of Marseilles to compete with those of Bordeaux in the supply of several of the southern departments with colonial produce, and Bordeaux does not even command the trade of the ten or twelve departments comprised within the basin of the Garonne. The navigation of the upper part of the river is impeded by various obstacles, and much time and labour are required in ascending the stream. It has been proposed to form a canal from Bordeaux to Toulouse, on which steam-tugs could be employed: another plan is, to improve the navigation of the river.

The coasting-trade of Bordeaux is greater than that of either Nantes, Marseilles, Hâvre, or Rouen. In 1837 the arrival of coasters at Bordeaux was 5770, burthen 218,038 tons. The produce and merchandise placed in the bonding-warehouses in the same year amounted in value to 2,100,000*l.*, being little more than one-third of the value of the goods and produce bonded at Marseilles or Hâvre.

The number of ships which entered in 1837 was 3428; and of these 2986 were French and 442 foreign, including in the latter 82 British vessels, 57 Dutch, 57 Swedish and Norwegian, and 24 belonging to the United States of America. The number of registered vessels of Bordeaux, in 1837, was 335; and of these 201, of the average burthen of 269 tons, were employed in foreign trade, and 104 were coasters, averaging 100 tons each. The port will admit ships of the greatest burthen, and is capable of containing 1000 vessels.

Wine is the staple article of the commerce of Bordeaux, and claret is scarcely shipped at any other port. The first growths, those of Château Margaux, Lafitte, Latour, and Haut Brion, are from the district of Médoc, on the left bank of the Garonne, below Bordeaux. In 1829 the quantity of wine exported from Bordeaux was 9,643,053 gallons, and 2,013,795 gallons of brandy. A twentieth part of the wine and a tenth part of the brandy were sent to England; but we consume only one seventy-seventh part of the wine exported from the whole of France, and our general consumption is twenty-four times less in proportion than that of Holland, Belgium, or Denmark.* Bordeaux suffers severely from the prohibitive system of commerce, its interests being involved in the manufacture of and trade in an article of native growth whose exchangeable properties exceed all others. In no part of France consequently are the true principles of trade so well understood or so ably discussed as at Bordeaux. The interests of the wine-growers of France, like those of the cotton-growers of the United States, are intimately identified with the principles of commercial freedom. If English iron and other English productions could be admitted at a moderate duty into the port of Bordeaux, in exchange for the superior wines of the department of the Gironde, there is no city in France which would rise higher in all the attributes of commercial prosperity. Since the decline of the French colonial possessions, with which Bordeaux was much connected, industry has been directed to manufactures of various kinds—perfumery, distillation of liquors, weaving of stockings, carpets, and cottons, and the making of earthenware, porcelain, bottles, paper, &c.; and there are refining-houses for sugar, iron-foundries, ropewalks, and ship-yards. Notwithstanding these efforts the population is declining;† and recollecting what Adam Smith tells us, that "the progressive state is in reality the cheerful and the hearty state to all the different orders of society," and that "the stationary is dull, the declining melancholy," we cannot but offer our sympathy for the Bordelois, who have exerted themselves so strenuously for the extension of commercial intercourse with England; though in vain, hitherto, have they raised their voice, and, as one of the consequences of its commercial policy, pointed out the inferiority of France in the practice of the useful arts. At this moment France does not possess one railroad of importance; she has not sent a single steam-ship across the Atlantic; and her mercantile marine is little more than one-third as extensive as that of the United States of America. 'La Gironde,' a magazine published at Bordeaux, says that the duty on foreign iron is the chief cause of French ships being unable to compete with those of other countries. In the 'Companion to the British Almanac' for 1840 it is stated that, of the shipping which entered and cleared French ports in 1837,

* See 'Penny Magazine,' Nos. 304 and 444, for notices of the commercial relations of France and England; and No. 270, for an article on the 'Importance of the Cultivation of the Vine in France.'

† Census of 1831—Bordeaux, 109,467; department of the Gironde, 554,225. Census of 1836—Bordeaux, 98,705; department, 555,809.

68 out of 100 were foreign and only 32 French. From the same work we learn that the tonnage of England, the United States of America, and France, in 1837-8, was as follows:—England and the colonies, 2,890,609; United States, 1,882,102; France, 696,978. Dr. Bowring has shown, in his Reports on the 'Commercial Relations of Great Britain and France,' that since the commencement of the prohibitive system in 1787, the commerce of France must be considered to have been retarded 35 per cent. In 1787 the whole foreign trade of France employed 694,269 tons; in 1830 only 526,856 tons. The colonial trade in 1787 employed 114,064 tons; in 1830 not more than 102,283; and the colonial interest has since been in an extremely languishing state.

THE MATERIALS AND MANUFACTURE OF CORDAGE.

In the 'Penny Magazine,' vol. ii., p. 319, the reader will find a description of *hemp*, and an account of its mode of cultivation in various countries. We will here take up the subject at the point where it was left in that article, and trace the various processes by which the fibres of hemp are converted into the enormous and powerful cables with which our ships are provided.

An allusion was made, in the paper above referred to, to the conveyance of hemp in carts through the streets of Naples to *pond*, where it is macerated or steeped in water. The object of this maceration, which is performed in every country where hemp is cultivated, is to separate the substance of the stalk from the rind or barky portion, which consists of fibres. The steeping is called *retting;* and the common mode of effecting it is thus:—When the hemp is gathered, it is bound in small bundles, and is deposited in a pond, bundle upon bundle, until a solid stratum of hemp is formed. When it has been piled to such a thickness as the water will permit, generally about five or six feet, the whole mass is loaded with large pieces of heavy wood until it is completely immersed. When it has remained in this state from five to eight days, it is taken out and conveyed to a piece of mown grass or clean sward land. The bundles are here untied, and spread out singly, stem by stem. Here they remain five or six weeks, being frequently turned in the interim, and are then gathered, tied up in large bundles, conveyed to a store-room, and there kept quite dry until wanted.

The object of this soaking in water is to render the fibres easily separable from the central core. The same thing is sometimes effected without soaking, by what is called *dew-retting*. The hemp-stalks, immediately after being gathered, are laid out regularly on a piece of level sward land, and there exposed to the vicissitudes of the weather for several weeks. It is ascertained, by trial, when the bark is easily separable, and that is the proper time for gathering and housing the stems.

Various suggestions have been made for improving the mode of loosening the fibres, both on account of the slowness of the common methods, and the unhealthy effect on the air produced by steeping such a large quantity of vegetable matter in stagnant water.

One of these methods, suggested by M. Brealle, consists in soaking the hemp in hot water containing a little soap, which is said to loosen the fibres in the course of a few hours. But we shall merely observe that all the various methods have for their object the loosening of the fibres of hemp from the central core.

The next part of the process is to effect the separation. This is sometimes done by hand, the bark being peeled or stripped off. But where the quantity is large, a more expeditious plan is necessary; the stalks are dried, and the core (called the *reed*) is *crushed*, without breaking the fibres. This is effected in many different ways. An instrument called a *brake* is frequently employed. The hemp-stalks are first completely dried, and then pressed between a kind of table and a lever, by which the central core becomes crushed. Sometimes the same thing is done by sheer beating; and in the most complete manner by a mill, in which the stalks are crushed beneath a heavy stone.

The crushed core is then to be separated from the fibres; this is called *scutching*. One mode of doing it is for the labourer to take a handful of hemp in his left hand, and while holding it over the sharp edge of a board to strike it with the fine edge of a long flat straight piece of wood, called a *scutcher;* this beats or shakes out the loose fragments of core. But the same effect is now more conveniently produced by fixing a number of scutchers on the same axle, and working them by a mill.

The fibres are at length separated from the central core, and the next process is to *heckle* them, which is nearly equivalent to the *combing* of wool. A heckle consists of a number of teeth, or pins, fixed in a flat square piece of wood. The points of the teeth being uppermost, the workman takes a small bundle of hemp in his hand, and striking it upon the teeth of the heckle, draws it quickly through the teeth. Coarse heckles are used first, and then finer. This process straightens the fibres of the hemp.

The hemp is now in a condition to be transported from country to country, for which purpose it is tied up in bundles or hanks. The Russian hemp is separated into four different qualities, and the quantity annually exported from St. Petersburg is two million poods, a pood being one sixty-third of a ton. Our importation of undressed hemp amounts to nearly 700,000 cwt. annually.

The bundles of hemp being transferred into the hands of the ropemaker, he commences his operation. The manufacture of ropes and cordage from hemp is an art of very ancient date; and it appears to have been carried on nearly in the same manner in different countries for ages. As the fibres of hemp are usually not more than three feet and a half in length, it is necessary to join them either by *knots* or by the process of *spinning;* the tyeing of knots is obviously an impracticable method and therefore the fibres are joined by that peculiar effect produced by spinning or twisting them round one another; this simple process is the foundation of all our woven fabrics of linen, cotton, or wool, and would also be the case with silk, were it not that the silk-worm provides a filament in one continuous length.

The fibres are twisted into a loose kind of string called *yarn*, but this would untwist and the fibres separate if left in this condition; therefore even in sewing-thread and twine, however fine they may be, it will be found that there are two or more constituent threads or yarns joined, by being twisted round their common axis in a direction contrary to their individual twist. This combined twist is called a *strand;* but the principle here explained is only capable of being carried to a limited extent, because whenever the threads or yarns are very numerous their proportionate diameters are so small compared with that of their combined mass, that they are not capable of counterbalancing the strand of the twist they compose. Therefore three of these combined masses are joined together by another contrariety of twist; and these form what is generally called a rope, technically a *shroud-laid* rope. But when nations began to use immense cables (some of them twenty-four inches in circumference) for their ships, it was found that the three-fold twisting here described was insufficient to retain in their proper places the immense number of threads necessary to their formation. Where a large mass of threads are twisted all the same way, the outer ones have a greater degree of strain or tension than the inner, and are therefore more liable to break. Instead, therefore, of making a cable of three very thick strands, it is customary to make them of three shroud-laid ropes, each of which is formed of three strands. The composition of a large cable is therefore somewhat curious, and may be thus

summed up:—a number of hempen fibres are twisted (say towards the right) into yarns or threads; a number of these threads are twisted towards the left into strands; three of these strands are twisted towards the right into shroud-laid ropes; and finally, three such ropes are twisted into a cable. In each of the different stages the compound portions are made up by twining the component parts round their common axis; and the object of the whole is to make the rope not only strong, but also hard and compact, and thus prevent the too easy admission of water, which would occasion the rope to rot.

These being the principles on which a rope is formed, we proceed to the mechanical operation of forming it. The making of ropes is commonly effected in a *rope-walk*, which is a straight path about four hundred yards long, with some wheels and revolving reels at one end, and some farther apparatus at the other. The hemp, as it comes into the ropemaker's hands, has to go through the process of *hatchelling*. The hatchell is a kind of comb, consisting of several teeth set upright in a board, nearly resembling the heckle before described. About a pint of oil is sprinkled on a hundredweight of hemp, and it is then combed out and straightened by being drawn over the teeth of the hatchell.

The next process is to spin the fibres of hemp into yarn or thread, which is done in a manner analogous to that of ordinary spinning. The spinner carries a bundle of dressed hemp round his waist, with the two ends of the bundle united in front. Having drawn out a number of fibres with his hand, he twists them with his fingers, and fixing this twisted part to a hook attached to a wheel, which is put in motion by an assistant, he walks backward along the ropewalk, the twisted part always drawing more fibres out of the bundle round his waist, as in common spinning. The spinner takes care that these fibres are properly supplied, and that they always enter the twisted part with their ends, and never by the middle. The respective duties of the spinner and of the wheel then are these:—that the spinner lengthens the thread by increased portions of fibre, while the rotation of the wheel twists the thread as fast as the fibres are supplied.

When the spinner has reached the end of the walk, the first end of the thread is detached from the wheel and attached to a reel, on to which the whole of the thread is wound, the spinner walking forwards until the winding is completed. The diameter of the thread thus formed is about one-tenth of an inch, and the length thus spun averages about three pounds weight.

The yarns are then stretched from a length of about 320 yards to 400, and a slight additional degree of twist given to them. The process of *tarring* succeeds. The short duration of ropes when exposed to the alternate action of wet and dry necessarily led to the invention of some cheap and simple preservative, which, by the general practice of most nations, seems to be best effected by the use of boiling tar, through which a mass of yarns, generally consisting of two or three hundred, are slowly drawn and compressed on leaving the tar-kettle, so as to discharge the superfluous tar. Sometimes the yarns are made to wind off one reel, and having passed through the vessel of hot tar, are wound on another; but generally the skeins or hanks are drawn by a capstan with an uniform motion through the tar. The yarn for cables requires more tar than that for other and smaller ropes.

The yarn is now ready to be formed into *strands*. A number of yarns are attached to a hook at each end, and are then twisted round another, the twist being, as we before observed, in a contrary direction to that given to the individual fibres of the yarn. The ends of the yarns being attached to machines turned by men, the yarns themselves are twisted continuously until they present a very hard and firm surface.

These strands are then twisted, three together, in a reverse direction from the last twisting, more force being required in proportion as the rope enlarges in size. Finally, the shroud-laid ropes last produced are twisted, three in number, to form the cable. In all these cases the rope or string is supported by props at stated distances along the ropewalk, and twisted round one another by force applied at the end.

The large cable of a first-rate man of war is 25 inches in circumference; it contains 3240 threads in thickness; one hundred fathoms of it will weigh 114 cwt., and it will bear a strain of 114 tons. From these large dimensions cables proceed down by gradations to that required for a small brig, which is 11 inches in circumference; 100 fathoms weigh 21 cwt.; it consists of 612 threads, and will bear a strain of from 20 to 30 tons. Chain-cables are, however, now in general use for sea-going vessels; but we cannot enter into an account of them in the present article, which is confined to Cordage.

The inconvenience of having a long path for the ropemaker to work in has led to the invention of numerous machines, having for their object to prepare ropes under a covered apartment, and also to perfect the manner of combining the strands together. Most of these inventions have failed in some way or other; and those which have succeeded need not occupy our attention here, as what has been stated will sufficiently show the nature of the processes by which ropes are produced.

Flat ropes are sometimes made for various purposes. To effect this, smaller ropes are stitched or fastened side by side; or else they are united by a species of rivet applicable to the purpose.

We have hitherto spoken only of the rough *tarred* rope, made for the purposes of the mariner; there are, however, numerous kinds of smaller cordage called *twine*. These need not call for much remark, since the same principle, modified in its application, is observed here as in the formation of stout ropes. What is called *bolt-rope twine*, used in sewing sails to their bolt-rope, is made of long hemp spun into yarn, and then twisted into twine without the application of tar. Eight threads are spun out of half a pound of hemp, each fifty yards long. The twine with which the seams of sails are sewn is made of the best hemp, spun to that particular thickness that eighteen threads, each fifty yards in length, may be produced from half a pound of hemp. Either two or three of these threads are then twisted together. Various other thicknesses and qualities of cord, string, or twine (for these terms are often indiscriminately applied) are made from untarred hemp; but it is sufficient to say of the whole of them that the hempen fibres are first spun into yarn, and that several yarns are twisted into a cord, with more or less of closeness and finish, according to the smoothness required.

We may remark that *any* fibrous substance may be made into a rope; but that hemp is found to possess a greater number of desirable qualities than other bodies. Some would be too costly; others too weak; and others again deficient in some one of the requisite qualities.

Secondary Branches of Industry in the Remote Parts of Sweden.—In Sweden, north of the Bothnian Gulf, the government grants land in the forests on condition of certain proportions of it being brought into cultivation within a stated number of years. The settlers are poor persons from other provinces of Sweden. These cleared spots in the forest, perhaps thirty or forty miles apart from the rest of the world, have grown, in the course of two or three generations, into settlements of ten or twenty families. Mr. Laing, in his 'Journal of a Tour in Sweden,' gives some account of the industry of the poor persons who reside in these insulated spots of cultivation — for, in spite of the possession of land, poor they remain, owing to the frequent failure of the scanty crops, and all trade being confined to a privileged class: in latitudes above 60° the failure of one crop in five is considered certain, but it is usually far more frequent. "These people," Mr. Laing says, "can

seldom raise any more agricultural produce than, with the aid of fishing, snaring ptarmigan, and using bark-meal, can keep a family. To pay their land-tax and other necessary demands, they have one or two secondary branches of industry. One is preparing saltpetre. This is received by government at a certain price, and the peasant can pay his taxes with it, although earning very little for his labour. It has introduced a singular habit among the inferior animals. To collect the urine for this manufacture, the little children and women watch the cattle with a pail, and have not only brought them to fixed periods of the day, but even out of doors they will not stale until they see the child with the bucket to receive it. In no country, not even in Flanders, is there more attention paid to the collecting of all sorts of manure, which is transported in barrels to the little field on which it is used. The peasants are so much enlightened on the value of manure, that if they could pay their land-tax as readily by any other means than delivering saltpetre, they would prefer applying the urine they collect from their cattle to the fields. Potash is another manufacture which flourishes as a secondary branch of industry. The ashes of leaf-trees, that is, in this country, the birch, aspen, mountain-birch, hag or wild cherry (*prunus padus*), and alder, will yield potash; but not of the needle-trees, that is, pine or fir. Saw-dust will yield none. A barrel of good ashes will yield about 40 lbs. of raw or 35 lbs. of calcined potashes, which will bring in about three shillings sterling to the peasant. This manufacture is extending, and even here (Degerfors) there is a calcining furnace, at which each man prepares his own potash. Tar is a third article of manufacture."

The Australian Bommereng.—This is a thin curved missile about two feet four inches long, and can be thrown by a skilful native so as to rise upon the wind with a rotatory motion and in a crooked direction towards any given point with great precision, and to return after a considerable flight to within a yard or two of the thrower; or, by first striking the ground near him, to bound so as to hit at a given distance, *en ricochet*, any object behind a tree. This is a very singular weapon, and probably originated in the utility of such a missile for the purpose of killing ducks where they are very numerous, as on the interior rivers and lagunes, and where accordingly we find it much more in use than on the sea-coast, and better made, being often covered with good carving.—*Mitchell's Australia.*

Immense Herd of Cattle.—Towards evening, on rising a hill, we were suddenly greeted by a sight which seemed to astonish even the oldest amongst us. The whole plain, as far as the eye could discern, was covered by one enormous mass of buffaloes. Our vision, at the very least computation, would certainly extend ten miles; and in the whole of this great space, including about eight miles in width from the bluffs to the river bank, there was apparently no vista in that incalculable multitude. It was truly a sight that would have excited even the dullest mind to enthusiasm. Our party rode up to within a hundred yards of the edge of the herd before any alarm was communicated. Then the bulls, which are always stationed round as sentinels, began pawing the ground, and throwing the earth over their heads: in a few minutes they started in a slow clumsy canter; but as we neared them, they quickened their pace to an astonishingly rapid gallop, and in a few minutes were entirely beyond the reach of our guns, but were still so near that their enormous horns and long shaggy beards were very distinctly seen. Shortly after we encamped, our hunters brought in the choice parts of five.—*Townsend's Journey across the Rocky Mountains.*

Ivy.—Ivy is one of the few shrubs which will bear without injury the smoke of London, and this property renders it exceedingly valuable for street houses. About London it is raised in immense quantities in pots, and trained to the height of from six to twelve feet on stakes, so that at any season of the year a hedge may be formed of it, by training it over an iron railing, or wire fence, or wooden railing, or lattice-work, or a naked wall covered with it, at an incredibly short notice. One valuable use to which the ivy may be applied, in street houses in towns, is to form external framings to the windows instead of architraves. In the interminable lines of naked windows in the monotonous brick houses built about fifty years ago, which form the majority of the London streets at the west end of the town, the ivy affords a resource which any householder of taste may turn to very good account. He has only to form projecting architraves of wire to his windows, and to place a pot of ivy on his window-sill, or in a small balcony, at the base of each jamb, taking care to fix the pots securely, and to make a provision for supplying them regularly with water. In rooms, ivy, when planted in boxes, and properly trained, may be made to form a rustic screen, either to soften the light, or to exclude a disagreeable view: and in very large drawing-rooms, plants in boxes or vases, trained on wire parasols, or other overhanging framework, will form a rustic canopy for small groups of parties, who may seat themselves under its shade, in the same manner as parties sit under orange-trees in the public rooms of Berlin and other cities of the Continent.—*Loudon's Arboretum.*

Benefits of Machinery.—The blessings which physico-mechanical science has bestowed on society, and the means it has still in store for ameliorating the lot of mankind, have been too little dwelt upon; while on the other hand, it has been accused of lending itself to the rich capitalists as an instrument for harassing the poor, and of exacting from the operative an accelerated rate of work. It has been said, for example, that the steam-engine now drives the power-looms with such velocity as to urge on their attendant weavers at the same rapid pace; but that the hand-weaver, not being subjected to this restless agent, can throw his shuttle and move his treadles at his convenience. There is, however, this difference in the two cases, that in the factory every member of the loom is so adjusted, that the driving force leaves the attendant nearly nothing at all to do, certainly no muscular fatigue to sustain; while it procures for him good, unfailing wages, besides a healthy workshop *gratis:* whereas the non-factory weaver, having everything to execute by muscular exertion, finds the labour irksome; makes, in consequence, innumerable short pauses, separately of little account, but great when added together; earns, therefore, proportionally low wages, while he loses his health by poor diet and the dampness of his hovel. The constant aim and effect of scientific improvement in manufactures are philanthropic, as they tend to relieve the workmen either from niceties of adjustment which exhaust his mind and fatigue his eyes, or from painful repetition of efforts which distort or wear out his frame. At every step of each manufacturing process described in this volume, the humanity of science will be manifest. New illustrations of this truth appear almost every day; of which a remarkable one has just come to my knowledge. In the woollen-cloth trade there is a process between carding and spinning the wool, called *slubbing*, which converts the spongy rolls turned off from the cards into a continuous length of fine porous cord. Now, though carding and spinning lie within the domain of automatic science, yet slubbing is a handicraft operation, depending on the skill of the slubber, and participating, therefore, in all his irregularities. If he be a steady temperate man, he will conduct his business regularly, without needing to harass his juvenile assistants, who join together the series of card-rolls, and thus feed his machine; but if he be addicted to liquor, and passionate, he has it in his power to exercise a fearful despotism over the young pieceners, in violation of the proprietor's benevolent regulations. This class of operatives, who, though inmates of factories, are not, properly speaking, factory workers, being independent of the moving power, have been the principal source of the obloquy so unsparingly cast on the cotton and other factories, in which no such capricious practices or cruelties exist. The wool-slubber, when behindhand with his work after a visit to the beer-shop, resumes his task with violence, and drives his machine at a speed beyond the power of the pieceners to accompany; and if he finds them deficient in the least point, he does not hesitate to lift up the long wooden rod from his slubbing-frame, called a billy-roller, and beat them unmercifully. I rejoice to find that science now promises to rescue this branch of the business from handicraft caprice, and to place it, like the rest, under the safeguard of automatic mechanism.—*Dr. Ure's Philosophy of Manufactures.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

LONDON: CHARLES KNIGHT & CO., 22, LUDGATE-STREET.
Printed by WILLIAM CLOWES & SONS, Stamford-Street.